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ENVIRONMENT, SAFETY AND HEALTH

ONSITE TECHNICAL ASSISTANCE

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Maintenance/Work Planning and Control

Richland: Tank Farms PUREX Plutonium Finishing Plant

Mound Fernald Idaho Oak Ridge Los Alamos Pantex Brookhaven Rocky Flats

Waste Management/Waste Minimization

Mound Savannah River

Medical Monitoring/Surveillance

Richland Idaho Pantex

MAINTENANCE/WORK PLANNING AND CONTROL

RICHLAND (TANK FARMS, PUREX)

This reporting period has seen the full maturation of the Enhanced Work Planning (EWP) program and the effective sharing of lessons learned and successful approaches to work planning. The processes developed through the Enhanced Work Planning Program have now gone from demonstration to full implementation at the West Tank Farms and PUREX. The Mentoring Team, Facility Representatives, and EWP team members continue to collaborate to maximize the benefits of the EWP Program and to develop and refine practical enhancements that advance the goals of increased efficiency, productivity, and worker safety.

Over the past 3 months, the EWP program has clearly demonstrated its benefit to the sites. Established performance measures continue to reflect that the program is well on its way to achieving its goals. For example, PUREX is still maintaining safety performance compatible to past performance while at the same time achieving dramatic increases in productivity. The critical path schedule is ahead by 38 days, and milestone completions are, on average, 124 days ahead of schedule. In addition, the lost-workday rate has declined to well below the DOE average. For the West Tank Farms, updated results indicate that the number of work documents completed has increased from an average of 77 per month to 97 per month. Furthermore, as a result of EWP improvements (in place since January 1996 at PUREX and April 1996 at West Tank Farms), additional achievements include—

< Reduction in cycle time of work packages from 133 days to 26 days at PUREX and from 242 days to 52 days at the West Tank Farms;
< Percentage reduction in the numbers of complex work packages by 90 percent at PUREX and by 50 percent at West Tank Farms;

- Projected reduction of $10 million in deactivation costs at PUREX, 3 months ahead of schedule;
- Favorable safety statistics along with increased productivity;
- Demonstrated effectiveness of hazard identification process through use of the job hazard analysis software; and
- Demonstrated effectiveness of the employee job task analysis process in compiling information for the placement of employees in appropriate medical programs.

Several fundamental tenets have been largely responsible for the stellar performance of Hanford's EWP Program. In particular, the program has focused on how to implement a graded approach to planning. Planning and conducting work while taking into consideration the complexity and risk of the job have produced dramatic efficiencies and cost savings without degrading worker safety. For example, K Basins now categorizes work as "routine," "skill-of-the-craft," and "planned," each type necessitating a different degree of planning rigor and documentation, based on complexity and risk. At both the West Tank Farms and PUREX, the automated job hazard analysis software is now being used by work teams to help evaluate the complexity and risk of a job in accordance with well-thought-out, defensible protocols .

Productivity, efficiency, and safety have also been enhanced through continued optimization of organizations and through the use of the team approach. For example, at PUREX, an organizational task team was formed to look at the impacts of the special voluntary retirement programs and personnel transfers. The task team was also charged with identifying additional ways the PUREX organization could work even more effectively. One enhancement identified from employee feedback was the need for a dedicated waste team responsible for repackaging waste. The new team, approved by management, will be structured similarly to the other field work teams in that it will have a team leader and dedicated radiological controls and nuclear operator staff roles.

Enhancements related to hazard identification and occupational health programs also continue to be identified and implemented. Through the EWP program, PUREX and West Tank Farms pioneered the use of the automated job hazard analysis process and tool. An updated, automated job hazard analysis tool is now ready for implementation at Hanford. The updated tool has many new features (such as incorporation of work permits) and is more user-friendly. The tool will be made available to PUREX and West Tank Farms and all of the Hanford Site in the near future. The refined process and tool should prove even more effective than the prototype tools originally used at PUREX and West Tank Farms. EWP training and mentoring activities are being planned to assist in implementation of the updated system at these facilities in October and November. With PUREX and West Tank Farms leading the way in demonstrating and implementing the job hazard analysis system, the successes and lessons learned from these efforts will be applied to implementing the process at other Hanford facilities in accordance with the overall implementation plan.

West Tank Farms has also implemented the employee job task analysis process and tool to provide necessary information regarding job requirements, hazards, exposures, and risks to allow for placement of employees in appropriate medical programs. Results from this implementation will be used to refine further the process for implementation across the Hanford Site. Training in the use of the tools and hazard recognition and hands-on mentoring assistance are important aspects of this implementation activity. Industrial Hygiene, EWP, and the EH Mentors will work with the facilities to help determine and provide support needs.

RICHLAND (PLUTONIUM FINISHING PLANT)

Reflecting the site's continued reliance on the Enhanced Work Planning program as a means to improve the work control process while ensuring worker safety, a new EWP initiative was launched at Hanford's Plutonium Finishing Plant. As a result of the proactive approach taken by plant management to determine how to do more with less, the EWP baselining process was used to identify potential enhancements throughout the entire work management process. To optimize efficiencies, productivities, and safety, and to meet facility and project milestones and objectives, management has employed enhanced work planning to develop, test, and implement a number of identified enhancements dealing with how work is identified, approved, and planned. The initiative will also focus on scheduling and coordination of work.

Specifically, during this reporting period, EH Mentors assisted plant management in a formal baselining process designed to identify areas where productivities, efficiencies, and worker safety could be enhanced through the application of proven EWP tenets and associated tools. The process relied on the involvement of multidisciplinary EWP teams made up of knowledgeable Plutonium Finishing Plant staff dedicated to improving work management. Facilitated by EH Mentors, an intensive 2-day meeting was held to evaluate the work management process and identify potential enhancements.

As a result of the meeting, management approved plans for three immediate enhancements: (1) reorganization of the maintenance work teams to redefine responsibilities for assigned tasks for workers and management, (2) improved scheduling of work associated with corrective maintenance to reduce the ever-increasing backlog, and (3) establishment of three EWP work improvement teams (comprising representatives from RL, Engineering, Operations, Maintenance, Radiological Controls, Safety, and crafts) and a work improvement steering team. The missions of the work improvement teams are to evaluate and make recommendations dealing with issues associated with work preparation, scheduling, and performance. The teams will be used to resolve issues and develop plans for implementing enhancements in their assigned areas. Enhancements will focus on streamlining management processes while improving safety integration, hazard identification, and occupational health support.

The Plutonium Finishing Plant steering team, made up of the three leaders of the work improvement teams and a steering team leader, is responsible for scheduling, coordinating, and focusing the mission. The steering team will be responsible for formulating an integrated work management improvement plan for final approval by plant management. The integrated plan will reflect a compilation of plans submitted by the three work improvement teams and capture various principles of EWP such as teamwork; risk- and complexity-based approaches; environment, safety, and health integration; and worker involvement. This effort will transition from the baselining phase to the demonstration phase in October 1996, when enhancements will be tested and refined.

EH Mentors experienced in the EWP process will facilitate all activities and offer lessons learned and work products from other similarly focused EWP efforts at Hanford and around the DOE complex. In particular, Mentors will help introduce the employee job task analysis and the job hazard analysis processes (including the tailoring and use of the job hazard analysis software) to the Plutonium Finishing Plant staff. These processes have already been successfully instituted at other Hanford facilities through separate EWP initiatives. The processes and software tools provide critical information on job requirements, hazards, and anticipated exposures so that medical qualification, exposure monitoring, and training can be optimized.

In particular, the automated job hazard analysis tool is scheduled for implementation in January 1997 as a key enhancement to the work planning and management process. This tool facilitates hazard identification and control by planners and helps integrate the various safety disciplines. The system provides a framework for logical, consistent, and defensible decision-making using graded, risk-based approaches in identifying job requirements.

OHIO (MOUND)

Mound's Enhanced Work Planning Demonstration Project continued to develop new enhancements and apply lessons learned from other sites. EH Mentors provided technical assistance to implement and test further improvements in the maintenance work control process, resulting in demonstrated, measurable improvements in productivity, safety performance, and cost avoidances.

During this reporting period, Mound's work control team completed selection and monitoring of performance indicators to measure and track enhancement success. The indicators were based on multiple enhancements initiated across a wide range of activities through integration of safety and health in the work control process. Measurements completed during this reporting period have documented the following work control efficiency gains.

- A 100-percent increase in the completion of scheduled maintenance work involving radiological control technicians. Maintenance scheduling enhancements involving revised procedures for resource loading support crafts have achieved and sustained an average level of accomplishment of 90 percent for scheduled work. The increased productivity resulting from these improvements has generated an estimated annual cost avoidance of $200,000.

- A 66-percent reduction in the number of training no-shows for maintenance personnel.

- A 44-percent reduction in maintenance service request cycle time from 125 days to 70 days. This has resulted in increased efficiencies in the field and more rapid turnaround of work orders, which has significantly increased customer satisfaction.

- A $35,000 annual cost avoidance through increased efficiency of the work request review process.

In addition to identifying specific performance indicators, Mound's work control team focused on four other areas of support during this reporting period: (1) implementing and further refining enhancements identified during the last quarter, (2) identifying new enhancements, (3) reviewing lessons learned from other sites for their applicability to Mound, and (4) developing a vision for Mound's postdemonstration expansion of enhanced work planning.

In support of the Work Control Team, EH Mentors assisted in reviewing existing enhancements to ensure the desired results were still being achieved. The Enhanced Work Planning Team continued to refine scheduling procedures for work involving Radiological Control Technician support, which resulted in improved work execution efficiency. Timely submission of Radiological Work Permits was also reviewed and changes implemented that resulted in permit initiation early in the planning process. The team also evaluated enhancements for how modifications to the work prioritization system could produce more effective utilization of both planning and skilled-craft labor resources. These newly developed priorities will enhance Mound's ability to manage work assigned special emphasis under the risk assessment code procedures.

This reporting period, the work control team also launched several new initiatives in four areas: (1) finalizing the metrics to be used to measure performance, (2) establishing a new material movement team to look at improving material moves, (3) developing enhancements for emergency maintenance service requests, and (4) exploring use of delay codes for enhancing work control analysis.

EH assistance was provided in examining existing data base information to extract input for maintenance work request cycle time measurements. This same information was used to determine whether work package completion rates fell within an acceptable target range. Late in the quarter, the site finalized requirements to establish a new material movement team. This team has begun to look at ways to reduce conflicting priorities and lack of communication among organizations requiring transportation services.

To respond more efficiently to last minute changed priorities, another new initiative to enhance emergency maintenance service request procedures was developed. Communication of concerns between the scheduling team and management has produced changes that have resulted in improved response capability.

The Enhanced Work Planning Team examined lessons learned from other sites involved in enhanced work planning to see if they might apply at Mound. Two of these, scheduling at Idaho National Engineering Laboratory and deficiency tags at Fernald, were initially considered promising, but only the scheduling issue proved to be useful. Fernald's deficiency tag procedures were designed to correct minor redundancies in the maintenance service request submission process as well as assist maintenance personnel in identifying the work location. Payback in these areas was considered too insignificant to devote the dedicated resources required to manage a similar initiative.

As the demonstration project approached the end of Phase I, the site began to develop a vision for how to capitalize on enhanced work planning concepts learned during the first phase. Two specific changes have occurred, both of which indicate strong buy-in and support for EWP by contractor and local DOE Area Office participants. These changes included incorporating expansion of Enhanced Work Planning in the Cost-Plus-Award-Fee period beginning October 1, 1996. The primary focus during the next two quarters will be on expanding into areas external to maintenance (project management, radiation protection, and exploring job safety hazard analysis considerations developed at other sites), while continuing to monitor and refine Phase I enhancements.

Finally, Mound management sent the EWP Scheduling Team Leader to review INEL's integrated scheduling system and to exchange information relative to Mound's scheduling successes. Performance indicator measurement documentation was obtained from Fernald's Core Team Leader and provided additional input for the Work Control Team's consideration. EH Mentors responded to a request from the Rocky Flats Core Team Leader to provide service request description of work input for possible use in improving their work control process. EH Mentors at Richland were contacted regarding the medical monitoring and medical surveillance program to determine if the newly developed employee job task analyses might be exportable to Mound.

IDAHO

EH Mentors are providing support to the Idaho Operations Office and its management and operating contractor in developing and implementing an enhanced work control process. This process, which became effective in August, builds on the strengths and successes of the previous work control system, with enhancements to streamline the overall process. The enhanced work

control system provides significant cost avoidance and improved worker productivity. Performance indicators have been established to measure these attributes.

Major accomplishments include (1) completion of the plantwide, integrated schedule for Nuclear Operations and Site Services maintenance activities; (2) a work order priority rating system to process work orders effectively through the work control system; (3) accounting for environmental, safety, and health considerations as well as compliance and operational issues; and (4) a job requirements checklist, which is an interactive, computer-based tool to assist the work order preparer. The Hanford Job Hazard Analysis tool served as the basis for Idaho's job requirements checklist. The plant work control procedure was finalized by incorporating comments generated through a successful procedure validation process. Training materials for specific training of personnel involved in the work control process and for generic training of remaining plant personnel were completed, and the training was conducted. The enhanced work control procedure became fully operational on August 12, 1996.

Some of the products developed as part of this Enhanced Work Planning project are described below.

The Integrated Scheduling System standardizes and combines all activity and resource data into one common data base. It allows coordination of activities among Engineering, Planning, Procurement, and Operations and Maintenance to fulfill plant schedule commitments. The three major components of the system are the integrated data base, the plan of the week, and the plan of the day. Resource needs (personnel, common-use equipment, outage requirements) are forecasted, and activity and resource conflicts are resolved. Schedule compliance is tracked and reported to plant management on a weekly basis.

The plan-of-the-week meeting provides plant management coordination and priority setting for scheduled maintenance activities on Chemical Processing Plant facilities and equipment (High-Level Waste, Nuclear Fuels, and Landlord/Utilities). It is also the forum used for resolving conflicts in resource requirements or work priorities resulting from unplanned events at the plant and for ensuring that activities requiring common use equipment and outages are understood and captured on the integrated schedule.

The plan-of-the-day meeting provides specific, daily coordinated resource allocation and priority setting for completing scheduled maintenance activities on Chemical Processing Plant facilities and equipment (High Level Waste, Nuclear Fuels, and Landlord/Utilities). It also is the forum used for resolving daily conflicts in resource requirements or work priorities resulting from unplanned events.

The job requirements checklist is an interactive, computer-based tool to assist the work order preparer in streamlining work package development and approval. It is used by all personnel trained and authorized to prepare work packages at the plant and consists of a series of logical questions for the "responsible person" (normally the plant engineer) to determine what technical advice, reviews, or approvals each organization needs to provide for work packages at the plant. It also ensures that the appropriate support organizations are contacted for advice or approval regarding hazard recognition and mitigation, personnel safety requirements, and regulations to be addressed for safe and correct job execution and ensures that all requirements are addressed.

The Maintenance Work Control Procedure incorporates a revised work order priority rating system that provides a tool for facility management to identify required work and then process work orders efficiently through the work control system. Environmental, safety, and health issues and

compliance and operational issues are considered in scheduling resources in concert with the integrated schedule.

The EH Mentor helped develop training material covering both generic and specific training on the new work control procedure. Technical assistance for the generic training included drafting a "script" and supporting presentation slides, as well as coaching the Maintenance Manager in preparing a training video. Technical assistance was also provided for preparation of training materials for the 4-hour detailed training. Eight training sessions were held in early August and were successfully completed by approximately 250 persons.

The training involved a complete discussion of the new enhanced work control procedure, including its applicability, its effective date, the procedure that it replaced, and training on the use of the tools developed for this process. The course content included a discussion of the roles and responsibilities of the major players (functional positions) in the new system, the new priority rating system, and the integrated scheduling system. The training included explanation and demonstration on using the job requirements checklist for identifying support organization involvement and the need for teamwork in work planning and approving work packages.

Training on the scheduling system focused on the means for the "responsible person" to define work scope, to identify need date and basis, and to estimate resource requirements to the scheduler for resource-loading activities associated with a job. In addition, the training clarified which type of work needed to be placed on the integrated schedule. It also discussed organizational changes, including roles and responsibilities of plant support, engineering, work control, and maintenance personnel. Training concerning quality assurance requirements and National Environmental Policy Act training for the responsible persons was given. The proficiency level of participants was measured by a multiple-choice exam at the end of the course.

EH Mentors from Hanford and Rocky Flats assisted plant personnel in developing performance indicators for the enhanced work control process. They met at Idaho to share information for building performance indicators for the work control process developed at other sites in the complex. These interactions brought together extensive experience in setting up performance measures from DOE, commercial nuclear power companies, and other private industry. Mentors have assisted in establishing performance measures at two Hanford facilities: PUREX and the Plutonium Finishing Plant.

With this assistance, the Enhanced Work Planning Team developed performance measures and management reports for the Chemical Processing Plant enhanced work control process. Baseline values have been established, and these performance indicators are being used for measuring changes in performance. The three highest tier factors measured are cost, schedule performance, and quality. These overall performance indicators are being used to monitor the progress of the enhanced work control system at the plant.

Each of the three factors has several lower tier measurements that are used to calculate performance values. For example, the cost performance indicator includes measurements of in-field work delays, routine work order usage, and planning and approval cycle times and costs. The schedule performance indicator has lower tier contributors of activities completed by need date, cycle time for work order completion, preventive maintenance delinquencies, plan-of-the-week compliance, and work order backlog. The quality performance indicator includes the factors of average cycle time, package workability, estimated versus actual labor, and customer satisfaction. The process for conducting a customer satisfaction survey was based on the one developed at Fernald for its enhanced work planning demonstration project.

Based on the success of the enhanced work planning initiatives in work control, medical surveillance, and issues management, Idaho is taking steps to implement enhanced work planning principles sitewide. The Executive Vice President of the management and operating contractor at Idaho transmitted a Safety Improvement Action Plan to the Idaho Operations Office. One action in this plan is to form a working group represented by all branches to determine how to implement enhanced work control practices sitewide. The contractor is planning to establish an INEL Sitewide Enhanced Work Planning Steering Committee to expand Enhanced Work Planning to all INEL facilities. This multidisciplinary team will include maintenance managers from each INEL facility; a maintenance work control representative; an environmental representative; a safety and health representative; a radiological control representative; a planning and scheduling representative; a quality assurance representative; an Operations Office representative; a DOE Headquarters representative from the Office of Environment, Safety and Health; and union (craft) representatives.

The purpose of this team will be to develop and execute a plan and schedule for establishing EWP at each of the INEL facilities. The committee will assist in focusing facility-specific enhanced work planning teams on the most important issues, evaluate EWP products and tools from other DOE sites for potential incorporation at appropriate INEL facilities, and recommend standardization of procedures and practices for sitewide implementation, where practical.

OAK RIDGE

During this reporting period, the computerized planning tool, Work Permit Planning Information System, has been developed for test evaluation at K–25. The Hanford and Fernald computer programs were reviewed by key personnel responsible for development of the Work Permit Planning Information System at Oak Ridge. Such exchanges enhance technology transfer, allowing identification of key aspects of each program to be incorporated into newly emerging systems such as the Work Permit Planning Information System.

The Work Permit Planning Information System will link key K–25 divisions during the planning process. Development of this system has been coordinated with Maintenance Division planners as well as personnel from other divisions. This will facilitate transition and use of the computer planning tool into the Maintenance Division and into other divisions at Oak Ridge.

When using the Work Permit Planning Information System, the originator describes the activity being planned on the first page of the computer planning document. All applicable permits (e.g., safety work permit, radiological work permit, lockout/tagout), along with other requirements, are then identified and documented within the planning document. The system guides the originator through this process. For a given permit, the originator of the work package can review pertinent information to determine its applicability, such as—

- When is the permit required?
- What are the training requirements for the permit?
- What are the laws, Orders, and procedures that drive the permit or requirement?
- What forms or tags are required?
- What are the site contacts to obtain additional information?

After completing the initial planning process, the originator has the capability to forward electronically the computer planning document to health and safety personnel or samplers, who can comment on the document and electronically send it back to the originator for incorporation of

comments. (The originator maintains control of the job planning document; reviewers have "read-only" access.)

The Work Permit Planning Information System will be used primarily for nonroutine projects. Consistent with EWP principles, the Work Permit Planning Information System will be a dynamic program, allowing continuous improvements to be incorporated as lessons learned at Oak Ridge and other DOE sites emerge. In the next period, system testing will include the identification of permits that can be eliminated or refined. The Work Permit Planning Information System will facilitate this process.

Before implementation of EWP concepts, the planning process at Oak Ridge required the originator of a job request to obtain review and approval of the project. Any comments or changes addressed by any one reviewer could bump the request back to the beginning of the review cycle. This process could typically require several days to coordinate.

Using enhanced work planning techniques, the planning process involves coordinating the project through a planning group, which meets periodically, as determined by work load. The planning group consists of the individuals required to review and approve projects. By using the Work Permit Planning Information System, reviewers can complete the review and approval process within an estimated 2 hours or less. The expected reduction in planning time for nonroutine projects may be as much as 50 percent. Major components of this reduction are the integrated team planning approach and using the computerized system not only to help identify project permits and requirements but also to help resolve conflicting requirements.

The identification of planning deficiencies and the associated corrective actions (including development and implementation of the Work Permit Planning Information System) is also expected to reduce costs associated with project delays by at least 20 percent. Project delays can be the result of any one of several factors, including failure to provide proper permits, conflict in permit and work requirements, and failure to assign work support personnel. Using the Work Permit Planning Information System and coordinating projects through the project planning group should greatly reduce or eliminate many of the factors that may result in project delays.

Another source of savings will be the reduction of redundancy in permits. The elimination or refining of permits and the reduction in generated paper will provide additional benefits and savings.

Two other tools developed by the EWP initiative at Oak Ridge are the Medical Occupational Health Information System and the Industrial Hygiene Analytical System. Information and data are transmitted from the industrial hygiene system to the occupational medicine system. Establishing electronic links between the two systems will greatly facilitate the transmission of occupational safety and health hazard information and exposure data to medical providers so that the data can be readily used by medical personnel.

The continued development of the Work Permit Planning Information System and support from senior management will facilitate the expansion of EWP throughout the Oak Ridge complex. To assist in the expansion of EWP at Oak Ridge, efforts during the next period will include demonstration and possible transition of successes from EWP projects at other sites to Oak Ridge.

LOS ALAMOS

At the beginning of this reporting period, Los Alamos National Laboratory (LANL) requested EH assistance in developing and implementing a Laboratory-wide maintenance work control process. The Facilities, Security and Safeguards Division Chief of Staff leads the special project group formed to ensure the work control program at LANL meets the commitments made to DOE in response to a Type A investigation of a near-fatal electrical accident in January 1996.

The accident investigation identified the lack of a formal work control process at the Laboratory as a primary cause in permitting a change in work scope to be made in the field with no review by Engineering or Environment, Safety and Health personnel. This was deemed to be a major factor leading to the accident. In response to the investigation, LANL committed to develop and implement a formal, Laboratory-wide maintenance work control process that would eliminate the need for standing work orders and ensure that all work would receive review by Environment, Safety and Health. A preliminary schedule to prepare the necessary documentation and training to implement an electronic work request system that incorporates the appropriate site (work location) hazard analysis before work authorization was developed. A facility management program work control plan was also drafted. The new program will be tested on a pilot project basis in designated facilities in mid-October.

A project team was formed consisting of the Facilities, Security and Safeguards Chief of Staff, an EH Mentor with expertise in enhanced work planning, a computer programmer, a representative of the maintenance subcontractor, a Laboratory safety and health representative, and an individual from Zone Maintenance. Additional assistance was provided by an EH Mentor with expertise in performance indicators, who helped the team develop performance indicators to measure progress of the pilot project and prepare for Laboratory-wide implementation.

The team drafted work control flow charts and an administrative document describing the work control plan for issuance in conjunction with pilot project initiation. The EH Mentor provided the team with information from other EWP sites to create LANL's list of "skill-of-craft" maintenance activities; however, the DOE Los Alamos Area Office (LAAO) has expressed a concern related to the Davis-Bacon Act (which requires that certain construction-related tasks receive Federal determination of applicability of the Act). LAAO's current approach is to perform a Davis-Bacon determination on standing work orders and not on the small job tickets initiated under the standing work order scope for routine maintenance tasks (which are specifically exempted from the Act); however, proposed enhanced work control procedures eliminate standing work orders, so it is imperative that the tasks listed as "skill-of-the-craft" do not require Federal scrutiny according to the Davis-Bacon Act. To date, LAAO has not yet concurred with the proposed approach. In view of the fact that the current work processing methods and the pilot project will run in parallel, the pilot will operate under the assumption that Davis-Bacon determinations will not be required. LAAO's concern, however, must be resolved before EWP can be implemented Laboratory-wide.

A computer programmer was assigned to the project team to develop an electronic work request system. LANL obtained the programs developed at Hanford and Fernald to use as models, thereby minimizing development time.

Key personnel from the three facility management units scheduled for initial participation in the pilot project held tabletop discussions on logic flow charts and the electronic work request system as well as hardware and software needs. The software needed to run the electronic work request program was procured, and field installation has begun. The pilot project is scheduled to last 5 weeks and will initially test the processing of skill-of-the-craft work to validate the electronic work

request system before taking on more complicated tasks requiring detailed site hazard analyses, management analysis, and detailed planning.

Following the January 1996 electrical accident, LANL management committed to formal implementation of a "zone maintenance" concept. In March 1996, a subcontractor with experience at other DOE sites was brought in to implement zone maintenance. The 12 maintenance zones are in various stages of implementation as staffing of the various planning and scheduling positions continues. One of the contractual deliverables was the development of a work control procedure for planning, scheduling, work performance, and work acceptance in the zones. When the work control project team was formed, the project manager named one of the subcontractor personnel as a team member to ensure consistency of the approach. The project team reviewed the draft zone work control procedure and revised it to ensure compatibility with the newly developed work control plan requirements document.

The work control plan and the zone maintenance work control procedure were issued in draft to all LANL facility managers in September.

Future assistance efforts will concentrate on pilot project completion, analysis of feedback from facility management unit personnel, revision of work control documents (as applicable), and preparation for expansion of the work control process to the other facility management units.

PANTEX

During the third quarter 1996, Pantex started its first EWP pilot project. Based on information on successes at other DOE sites and the conclusions from the EWP baselining effort conducted during the first 6 months of 1996, Pantex decided to use a new task, the Railcar Reconfiguration Project, as an EWP pilot. This was new effort for the plant involving activities that had not previously been performed at Pantex or anywhere else within the DOE complex. A multidisciplinary project team was assembled, and work planning meetings began in July.

It was immediately apparent that the EWP approach was more efficient and more effective than previously used project management techniques. Numerous hazards, risks, and problems were identified during the team-based procedure development process and addressed in team meetings even before the validation process began. Although Pantex is only 3 months into what was originally scheduled to be an 18-month effort, the project is progressing ahead of schedule at approximately 30 percent under the projected cost.

< Procedure development time was dramatically reduced through use of a team-based approach. Instead of the normal 6-month procedure development and approval cycle, the process was accomplished within 2 months.

< Including safety and health professionals on the project team reduced time needed to resolve issues relating to explosive component handling and packaging, Radiation Work Permits, confined space permits, and materials handling. In some cases, the number of required permits was reduced, thereby reducing or eliminating the time and effort required for acquiring permits.

< Workers participating on the team contributed valuable insight relating to the tools that would be effective in performing the work safely and efficiently. Workers also contributed significantly to the waste minimization effort by identifying opportunities for recycling virtually all the materials removed from the railcars.

< By including design agency representatives on the team, procedure approval time was reduced. The EWP process resulted in fewer memoranda and telephone calls between Pantex and the design agency staff, which contributed to shortening the procedure development and approval cycle.

Recognizing early successes of the EWP Pilot Project, the Facilities Operations Division has drafted a policy that all new maintenance activities and projects undertaken will be managed under the tenets and principles of EWP.

Overall implementation of EWP concepts at Pantex is being coordinated by an EWP Core Team. This team was responsible for performing the original baseline evaluation and recommending the adoption of a pilot project to validate the EWP concept at Pantex. The EWP Core Team is currently working toward establishing EWP concepts within other organizations at the Plant. With the assistance of technical experts from EH, Pantex is developing plant-specific EWP information and training materials that will be used to assist interested organizations within the plant in implementing EWP concepts. The effort of educating other organizations on how to manage EWP-based activities and projects will begin during the fourth quarter of 1996.

EH is supporting Pantex management in implementing EWP management concepts through access to technical experts and Mentors who are knowledgeable in EWP tenets and experienced in application of these tenets within the DOE system.

On another front, EH technical staff has undertaken an effort to make industrial hygiene data more readily accessible to the Pantex Medical staff. Pantex is reorganizing its industrial hygiene employee and work area exposure data base so that the information is organized into homogeneous exposure groups and providing a means to interface this information with the Pantex HealthNet system. The goals of the Pantex homogeneous exposure group effort are to—

< Document various health and safety risks to Pantex employees according to job code. This will assist the Occupational Medicine Department and the Personnel Department in scheduling job placement examinations and surveillance activities and in determining fitness for duty.
< Establish exposure groups based on job codes for employees having similar hazards and exposure potential. With this information, the job hazard analysis process can be streamlined, allowing work packages to be planned and executed faster. This has the potential to facilitate the development of a central data base of hazards other than those related to industrial hygiene.
< Manage health and safety support and surveillance activities based on risk to defined homogeneous exposure groups. Using a risk-based model for managing surveillance activities will result in reduced surveillance costs by only including those individuals in the program who need to be in the program.

The first phase of this effort is scheduled to be completed during October 1996. The value to Pantex for the homogeneous exposure group effort as a part of the overall EWP process is that they—

< Allow the Occupational Medicine Department to tailor medical surveillance to specific groups based on risk, thereby eliminating unnecessary effort and surveillance.
< Provide a “picture” of potential risks employees may encounter. This will assist in the knowledgeable management of risks and assist in job preplacement screening.
< Supplement job hazard reviews by providing a baseline for various employee groups.

< Document hazard review information in a manner that is consistent for different tasks.

In early September, Pantex established a new EWP subteam within the Facility Operations Division to evaluate the work order closeout cycle to determine if and how closeout cycle time can be reduced. EH is providing technical support to this team in learning how to apply EWP tenets.

BROOKHAVEN

An Enhanced Work Planning effort has been initiated at Brookhaven National Laboratory (BNL). The guidelines for a pilot EWP project have been established, and the pilot has management support. The participating departments and divisions are Plant Engineering (maintenance personnel), Alternating Gradient Syncrotron (maintenance requestor), Safety and Environmental Protection, and Advanced Technology (EWP expertise).

Currently, establishing safety requirements, requesting work permits, and obtaining other necessary approvals is performed in series fashion. In some instances, the safety requirements are not being identified until the start of the work. Other issues relate to planning and scheduling. Therefore, the main objectives of the pilot EWP project are to expedite acquisition of permits and notifications, and assure that work can be scheduled and then completed on schedule. The inclusion of proper safety requirements and the completion of satisfactory maintenance work is not an issue at BNL; however, accomplishing this in an integrated, efficient fashion can be improved.

There are three different types of maintenance at BNL through which work is accomplished: (1) preventive, (2) “call-in” (corrective), and (3) inter-Laboratory work (which connotes work of a larger scope, with longer lead time). The pilot project will focus on inter-Laboratory work.

The pilot will be initiated with a weekly planning meeting, where representatives from the appropriate disciplines will be represented. The subject of the meetings will be approved inter-Laboratory work forms that are ready to be implemented. It is hoped that the necessary permits and information can be provided at the meeting and that paperwork can also be filled out at that time.

ROCKY FLATS

During this quarter, at the request of Kaiser-Hill management, a member of EH’s Office of Field Support attended Activity Control Envelope Team meetings to provide feedback to Kaiser-Hill on how to better align the activity control envelope process with the EWP process. This review was completed, and the requested feedback was provided to Kaiser-Hill management.

As followup to the EWP Technical Exchange Meeting (reported last quarter) attended by the Fernald Maintenance Manager and representatives from DOE Headquarters, the Rocky Flats Field Office, and the integrating contractor at Rocky Flats, the EH Mentor provided Rocky Flats with (1) a demonstration disk and instructions for the Fernald Electronic Work Package, (2) a copy of a work order from Fernald, (3) the protocol used at Fernald to make determination for equipment “run to failure,” (4) an example of a work order for the purpose of getting a preventive maintenance action completed at Fernald, (5) copies of Fernald Core Team meeting reports, and (6) the job hazards analysis program developed by Westinghouse Hanford Corporation.

During this quarter, the Wet/Combustible Project Activity Control Envelope Team, which was one of the teams Kaiser-Hill requested the EH Mentor to critique, made considerable progress. The team completed project flow charts and documented expectations and task descriptions. With the

participation of subject matter experts from Employees, Operations, Engineering, Residue Stabilization, Hazard and Risk Management, Nuclear Safety, Criticality Safety, Industrial Safety, Industrial Hygiene, Radiological Engineering, and Human Factors, the team completed the generation and development of the project's hazards assessment.

The Wet/Combustible Activity Control Envelope Team is currently reviewing the necessary and sufficient standards applicable to this project. The team leader assigned standards to subject matter experts for review and comment. The team is expected to complete the standards review by the end of Septembe.

OHIO (FERNALD)

After 15 months of onsite involvement by EH Mentors, the EH Technical Assistance Program phased out involvement in the Fernald Enhanced Work Planning demonstration. A cooperative effort of EH, the DOE Ohio Field Office, the DOE Fernald Area Office, and the site contractor, the Fernald EWP demonstration is considered a tremendous success by all parties. The initiative demonstrated that fundamental principles such as a graded, multidisciplinary approach to planning—with emphasis on improved communication and worker involvement—can foster a safer work environment while saving money.

The Fernald EWP demonstration will pay for itself many times over. According to official estimates, about $300,000 has been spent to date on labor, travel, and materials associated with the effort. From this investment, more than $7.3 million has been estimated as the payback for 1996—a ratio of 25 to 1. Payback over the next 4 years is estimated at an additional $4 million per year. In addition, an 86 percent reduction in the average time to complete maintenance work requests is the result of better work packages, safety and health reviews, and prejob walkdowns.

As additional evidence of the demonstration's success, Fernald has added to its corporate organization its own full-time EWP Department, which will be responsible for continuing the implementation of EWP initiatives within maintenance as well as launching EWP programs within other groups across the site, such as Waste Programs and Construction.

Technical EWP activities supported by the EH Mentor over the last quarter centered around the implementation of the new, enhanced maintenance work control policies and procedures. For example, following beta testing of the new Electronic Work Package software system developed through the EWP initiative, training was conducted of more than 100 facility managers, planners, estimators, safety and health experts, Quality Assurance personnel, and others who have begun using the software for maintenance work in the site's "Blue Area."

The Electronic Work Package incorporates many of the enhanced work control processes developed over the preceding 15 months. It automates the work identification, planning, and approval processes described in the site's revised maintenance work control procedure. The Electronic Work Package routes work packages in parallel via e-mail to reviewers who electronically attach necessary plans, permits, material safety data sheets, job hazard analyses, and other information.

In addition to implementing the Electronic Work Package software, attention during the third quarter also focused on involving workers up-front in the planning process. This is now being accomplished through their formal participation in Work Coordination Center meetings and formalized job planning walkdowns. Efforts have begun to train the craft in their expected role at the Work Coordination Center and in the ways they can contribute to an improved work plan and

work execution. Also, mechanisms are being developed for determining how workers with pertinent specialty skills will be deployed to the necessary walkdowns and planning meetings.

Third-quarter mentoring activities also involved development of detailed technical specifications to allow Fernald's Information Management group to complete the programming of linkages between the Electronic Work Package, the Fernald accounting system (i.e., Computerized Material Management System), and radiation and industrial hygiene exposure data. These linkages dramatically enhance the quality and quantity of work activity and exposure information available to the groups within the safety and health organization, aiding the medical and industrial hygiene departments, epidemiologists, and attorneys. In particular, the linkages will be of tremendous benefit to workers by enhancing their understanding of workplace exposures obtained over the course of years or even decades.

The enhanced reports produced by the linkages will serve as a more defensible record of who was where, when, to do what, under which permits and controls, and with what resulting exposures. Medical departments and epidemiologists will be better able to relate exposure data with illnesses and actual types of work activities. Attorneys will be better able to prove outer boundaries of an individual's exposure for the work activities in which he or she was engaged over the course of employment. Cost savings are likely to result from this initiative due to a reduction in sampling costs of jobs and exposures already fully characterized. Also, better information affords DOE increased protection from legal liability.

WASTE MANAGEMENT/WASTE MINIMIZATION

OHIO (MOUND)

The Mound Waste Management Steering Committee, comprising representatives from Waste Management and projects and operations that generate wastes, successfully characterized and packaged newly generated low-specific-activity tritium laboratory waste. This waste will be sent to a private facility for disposal when a sufficient quantity is accumulated. This will be the first time that a waste stream has been collected, packaged, characterized, and readied for disposal at Mound without first becoming legacy waste inventory. The effort has focused on laboratory wastes from areas with contamination of less than 10,000 dpm/100 cm^2. An EH Mentor assisted the committee in developing procedures, conducting on-the-job training, and developing schedules to characterize, package, and ship low-specific-activity tritium waste for disposal. This initiative establishes a model and methodology that can be applied to address other Mound waste stream issues.

Mound management conducted a review of the waste disposal water treatment facility, disposal of newly generated waste streams, characterization of waste, and waste management project planning. This review indicated a need for improved project planning and removal of the barriers to the effective handling and moving of wastes at the site. Based on these findings, Mound management developed a project planning program for Waste Management project managers to organize personnel, clarify boundaries, establish interfaces, and identify elements required to complete Waste Management projects. The *Waste Management's Guide for Project Management* and a project file system were developed to standardize projects. EH Mentors are working with the Project Management Board and the contractor Vice President for Waste Management to assist department personnel in developing project plans and improving the process for completing waste management projects.

Mound management also developed the Project Management Plan for reengineering the alpha-beta waste water treatment system to accelerate closure, cleanup, and demolition of the Waste Disposal Facility. This plan will result in the shutdown of the Waste Disposal Facility by March 1997, achieving significant operating, maintenance, and repair savings. It is expected that approximately $700,000 in costs can be saved in fiscal year 1997 by expeditiously removing the Waste Disposal Facility from service.

The full scope of Waste Disposal building replacement includes identifying the sources of waste water to the facility, their volumes, and radioisotopic content and treating the balance of the water by an alternate technology. To accomplish this scope requires that source volumes and isotopic content be established and small-volume, local treatment systems be provided for Building 38, SW/R Building, and H Building. Beta-contaminated water will be stabilized in Aquasorb and shipped offsite for disposal. The alpha-contaminated water will be treated in a clariflocculator, the clean water discharged, and the sludge filter-pressed and packaged for disposal offsite.

The EH Mentor assisted Mound in analyzing waste moratorium issues against its commitments and recommended modifications to meet acceptance criteria. The moratorium was lifted in January 1996 based on a commitment to the Albuquerque Operations Office to complete corrective actions by January 1997. Currently, compliance with the submitted plan is incomplete with respect to developing and implementing procedures and conducting personnel training. The EH Mentor provided guidance to the Vice President, Waste Management, to correct these deficiencies by the end of fiscal year 1996.

Mound management has identified areas and categories of mixed waste that can be treated and disposed of offsite. The primary focus of this effort is the lead-lined tritium and alpha-contaminated rubber gloves. The EH Mentor helped identify outside sources of funding for performing treatability studies on these materials. One source is the DOE Idaho Operations Office Mixed Waste Focus Group. A proposal has been developed and is under review by Mound management that will use tritium operations and waste management staff personnel to remove tritium from lead-lined gloves. This effort, if funded, will allow lead to be encapsulated and disposed of at the contracted disposal facility. This program, when funded, will provide $159,000 of funding for the treatment study.

High-activity tritium waste poses a unique set of problems at Mound. It has a high level of hydrogen gas generated within the container as a result of beta energy interaction with water. This high level of hydrogen gas necessitates that these drums be shipped in Type B containers. The Type B containers, such as the TRU-PAC II, have a requirement that none of the void spaces within the container can have hydrogen gas in excess of 5 percent. The drums prepared at the Mound site have been stored for several years and may well have in excess of 5 percent hydrogen gas in their void spaces. There are no other Type B containers identified at this time in which these drums can be shipped. The EH Mentor is currently helping Mound research acceptable Type A containers or develop an application for recertification of TRU-PAC II for shipping these legacy containers.

The Waste Management and Conduct of Operations Mentors are working together to assist both Mound Tritium Operations and Waste Management personnel in packaging newly generated tritium waste in Type A containers with less than 1,000 Ci per container. This allows each Type A drum to be shipped to the disposal facility as it is generated and precludes the buildup of additional legacy waste.

At the request of Waste Management personnel, the EH Mentor is exploring the possibility of involving private-sector companies in the treatment of the transuranic waste being held at the

Mound site for volume reduction and disposal. Indications are that several companies would have strong interest in providing this treatment. This is being pursued to identify viable alternatives for the disposal of Mound transuranic waste and, if successful, would lead to more expeditious removal of transuranic waste from the site, which ultimately will be conveyed to the City of MiamisburgË

SAVANNAH RIVER

During July, August, and September, progress continued on the EWP initiative focused on waste minimization. This initiative is building on site successes in waste minimization using the EWP principles to improve productivity and efficiency while enhancing worker safety and health, and reducing the environmental impact of operations at Savannah River Site. This initiative provides an opportunity to apply EWP concepts (multidisciplinary teams, worker participation, and health and safety personnel fully integrated into work planning) in a project that provides some unique benefits that should be readily exported throughout the DOE complex.

Work planning enhancements present significant opportunities to reduce the environmental impact of onsite waste burial by reducing the volume of waste generated. Resulting cost savings estimates project a 40-percent reduction in waste at the Nuclear Materials Stabilization Program facility, alone, with opportunities for disposal cost savings in the range of $8,000,000.

Clearly defined measurement metrics are based on the cost of site burial, safety enhancements from reducing the radiological hazards in the workplace, and productivity improvements from enhancing the planning of decontamination activities. The challenges of planning decontamination activities (controlled area rollbacks) in an operating facility with transuranics contamination present some unique opportunities to implement and document good practices that can be exported to other Savannah River facilities, as well as throughout the DOE complex.

During the past quarter, the team has refocused efforts on completing the *Rollback Handbook* and infusing waste minimization planning into the work planning process. The *Rollback Handbook* captures the rollback process being implemented throughout H-Canyon. This handbook describes the process to implement a successful rollback, including lessons learned and enhancements to the work planning process. The handbook will be exported to other Savannah River Site facilities (beginning next quarter) and throughout the DOE complex. The final *Rollback Handbook* will be issued in October. The team has developed performance indicators that will be used to measure the success of a rollback program, including—

< Total square footage of contaminated area rolled back over time compared to the monthly rollback goal,

< Quantity of “Green is Clean” waste generated per month as measured in cubic feet after rollback completion and compared to the final program goal,

< Quantity of low-level waste generation as measured as cubic feet both during and after rollback and compared to the final program goal, and

< Value of equipment and materials recovered for future use and not disposed of, as measured in dollars, during the rollback process.

In addition to the readily quantifiable indicators described above, the team identified the following additional benefits of implementing controlled area rollbacks using EWP principles:

Safety was improved as a result of reduced personnel exposure to contamination—

< Reduced cost of personal protective equipment purchase and disposal.
< Reduced accidents and injuries due to wearing personal protective equipment.
< Reduced exposure to heat stress.

Production efficiency improved as a result of reduced hours needed to perform a work order and reduced work order cycle time.

The core team is currently evaluating procedures to calculate dollar savings from rollback activities.

The subteam formed to integrate enhanced waste minimization planning in the work planning process developed a comprehensive action plan and has completed baselining the existing work planning process and reviewing work packages to identify the current level of waste minimization planning.

The team is currently identifying additional planning concepts that may include (1) training for first-line supervisors and work planners, (2) performing a contaminated-tool inventory, (3) implementing a graded approach to waste minimization planning (similar to ALARA planning), (4) incorporating radiological control expertise into the planning process, (5) modifying the Work Package Procedure to flag waste minimization opportunities, and (6) incorporating the development of Pollution Prevention Activity Forms at prejob planning and completion of the forms during postjob review.

The core team will be identifying additional facilities to implement the *Rollback Handbook* during the next quarter.

As a side benefit of the EWP process, members of the EWP Core Team have been involved with a subcontracted scope to remove and process contaminated trees and vegetation at Savannah River Site. This project involved multiple-tier subcontractors, as well as union participation working under worst-case conditions for heat stress in personal protective equipment. Through use of EWP principles (multidisciplinary teams, worker participation, and health and safety personnel fully integrated into work planning), this "first-of-a-kind" project in the DOE complex was completed as a fixed-price project on schedule, within budget, with no personnel contamination or injuries. In addition, the project is currently being completed with an anticipated volume reduction ratio of 200 to 1, thereby saving valuable space and cost and minimizing environmental impact.

MEDICAL MONITORING/SURVEILLANCE

RICHLAND

Hanford's Enhanced Work Planning Program has focused on developing and implementing a Department model for a comprehensive, integrated approach to occupational health. The Hanford Occupational Health Process provides a systematic approach to meeting the needs of all parties responsible for occupational health, including line management, workers, safety and health professionals, and personnel from medical services and training. The objective is to take a risk-based and preventive approach to occupational health that is founded on solid, accurate, up-to-date information regarding job requirements, hazards, exposures, and overall risk. (See report of April–June 1996 for additional details.)

Fundamental to the Hanford Occupational Health Process is the compilation and communication to the employee of information regarding job requirements, hazards, exposures, and overall risk. With this information, employees can be placed in appropriate medical qualification and monitoring programs. Medical services can provide better feedback to line management regarding the effectiveness of hazard control and other preventive measures. Similarly, training can be developed and provided based on knowledge of the type and degree of hazards present in the workplace. EWP has supported this effort through development, testing, and implementation of two important processes and tools: the employee job task analysis and the automated job hazard analysis.

The employee job task analysis process and tool were developed to compile information on job requirements as they relate to employee qualifications, as well as job hazards, exposures, and overall risks. The employee job task analysis is periodically completed by line managers for all employees, with input from industrial hygiene. The employee job task analysis compiles information for routine work as well as nonroutine work that can be anticipated or predicted. The information gathered then allows for an informed decision regarding placement of employees into medical programs.

The employee job task analysis system was first demonstrated at K Basins. It was found to be both a convenient and effective process to compile the necessary information. Results from this demonstration showed not only that some employees are not currently placed in the necessary programs, but also that many employees are placed in programs that are not necessary. Overall, a net 37-percent reduction in the number of medical qualification and monitoring examinations can be achieved. Results from the K Basins demonstration indicate the ability to enhance the quality of medical services as well as eliminate unnecessary examinations and monitoring.

The employee job task analysis process has been expanded to West Tank Farms, where it was recently completed for approximately 260 employees. Results are currently being compiled. As part of this demonstration, an independent validation is being conducted to verify that the employee job task analysis process is accurate and effective in compiling the appropriate risk information.

The automated job hazard analysis process complements the employee job task analysis for nonroutine work. If a hazard or exposure was not anticipated on the employee job task analysis, the job hazard analysis will identify it as a “potential exposure hazards.” The system will then provide the necessary information regarding medical qualification or medical monitoring. In case the automated job hazard analysis is not used, an exposure form has also been developed as a manual tool for job hazard analysis.

In addition to complementing the employee job task analysis, the automated job hazard analysis has many other purposes, including (1) hazard identification; (2) screens for process safety, worker safety, worker exposure, radiological protection, nuclear safety, and environmental issues; (3) facility-specific screens to build in hazard information from safety analyses or other safety documentation; (4) triggers for the involvement of safety disciplines in work planning; (5) “help” screens to identify and manage requirements; and (6) integrated work permits to specify hazard controls and safety requirements.

Both the job hazard analysis and employee job task analysis processes have been formalized and adopted as sitewide programs entitled, respectively, “Prejob Safety Planning” and “Occupational Medical Qualification and Monitoring.” Implementation will be phased in at Hanford facilities from

approximately October 1996 to June 1997. EWP and mentoring activities at the facilities will support implementation.

In addition to providing fundamental information for the Hanford Occupational Health Process, these processes and software tools benefit work control, requirements management, and safety management and integration.

The automated job hazard analysis system has already demonstrated its value to the work control process. Used by the work planning team, the system provides hazard information so that the team can make appropriate and defensible decisions regarding the degree of planning and documentation required. With hazard and risk information identified through the job hazard analysis process, the team can, for instance, determine whether the job warrants detailed planning versus a "skill-of-the-craft" approach. It has been shown at West Tank Farms and PUREX that jobs requiring the highest level of planning have been reduced by 50 percent and 90 percent, respectively. The automated job hazard analysis process has been a major contributor to efficiency and productivity gains, as well as to effective hazard identification and control.

The "help" screens on the automated job hazard analysis provide the work planning teams with key requirements that must be addressed for the various hazards identified in planning and conducting work. In addition, triggers are incorporated for involvement of the various environment, safety, and health disciplines. This involvement further helps the planning team identify requirements and incorporate them—and associated actions—into the work package and work permits. The automated job hazard analysis also contains all work permits. As hazards are identified that require permits, the permits are brought up into the automated tool and are completed with the necessary requirements and instructions. Finally, a facility- and project-specific screen can be developed to emphasize hazards, conditions, and requirements characteristic to that particular work.

The automated job hazard analysis process has hazard screens that address nuclear safety, radiological protection, process hazard analysis, potential exposure hazards, worker safety, environmental issues, and facility-specific hazards. This allows for the effective integration and involvement of the various safety disciplines into the planning and conduct of work based on hazards identified. Technical resources can therefore be applied and focused on activities based on risk. If desired, facility-specific screens can also serve to integrate key information from other safety documents such as safety analysis reports.

In summary, the automated job hazard analysis process serves not only as a means to identify and control hazards effectively, it also benefits work control, requirements management, and safety integration. It this manner, it can serve as a process and tool that facilitates meeting DNFSB Recommendation 95–2, "Safety Management." It is important to implement the tool within the concepts of EWP, and an implementation plan and approach is being devised to accomplish this objectiveË

IDAHO

Idaho is engaged in an EWP demonstration project to enhance medical surveillance of workers. The INEL Medical Department has begun an enhanced industrial hygiene data gathering project to improve the quality and quantity of chemical exposure data collected and to establish links with medical data records. The results will greatly improve sitewide feedback to line managers and industrial hygienists and provide more complete and timely worker exposure records. This improvement will facilitate early prevention and detection of health problems and assist line

managers with more complete data concerning worker exposure and training. The integrated system will facilitate coordination among line management, industrial hygiene, training, hazard communication, and occupational medicine.

The new system will allow trending of exposures so that unacceptable conditions can be corrected and affected employees can be counseled before the health events increase or intensify. Conversely, the new system will allow the rollback of overly conservative and non–value-added hazard controls, medical monitoring, and training by providing easily retrievable validation that protective controls are appropriate.

The detailed project and implementation plan has been completed, and the project team has begun to gather system requirements and design the computer system and work process. The detailed work plan/implementation plan encompasses system development, deployment to a test environment, and user testing.

INEL is using EWP principles to address problems with the quality and quantity of their exposure data related to industrial hygiene, which measures the actual exposure hazard of jobs. The enhanced system for hazard assessment will greatly refine the job hazard assessment step of work planning. It will also validate qualitative exposure assessments. The improved data, both quantitative and qualitative, will allow planners to determine confidently the need for hazard-specific training, medical monitoring, and the impact of medical restrictions on individuals who may be selected for a job. Giving planners this ability will foster safe and efficient work.

INEL's current data system is not user-friendly for either those who put data into the system or those who wish to use the data. The new system will eliminate much of the current need to enter data that has already been captured on field data sheets and will ensure that data recorded only in field logbooks is not inadvertently lost. It will provide a means for entering data onto a centralized electronic data base for long-term storage in a format that can be accessed by others. The new system's relational format and querying capabilities will allow users to generate customized reports on exposure and health outcome trends that currently are not feasible without massive amounts of manual data manipulation. In addition, the new system will propagate the data that are entered to all appropriate users and notify individuals who are responsible for taking corrective action when the data exceed trigger values.

The data in the new system will reflect the ACGIH and the American Industrial Hygiene Association's national consensus document for specifying industrial hygiene data, which will enhance the uniformity, consistency, and relevance of the data for INEL, DOE, and public health officials.

INEL is developing the enhanced hazard assessment system using the same approach and tools that they used to develop their highly successful Occupational Medical Surveillance System, a state-of-the-art, computerized medical records system. This INEL system uses a robust computer-assisted-software-engineering tool that can be easily transported to other DOE sites. The Nevada Test Site is adapting the Occupational Medical Surveillance System and expects development to require only 10 percent of the cost and time that INEL expended. Richland is currently evaluating Idaho's computerized system as a possible component of the Hanford Occupational Health Process under development for the Hanford Site. Pantex also is evaluating Idaho's medical surveillance system for their own use.

EH is co-funding this effort since the system will be an excellent model for other DOE sites, all of which are facing similar problems with the quality and quantity of exposure data related to

industrial hygiene. The project is on schedule for completion in March 1997. INEL anticipates a follow-on effort to improve the usefulness of the information that is regularly exchanged between line management, industrial hygienists, occupational health, and training.